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A Question Mark on Emerging Zinc-Related Nutritional Deficiencies in Pakistani Population

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To the Editor:

Micronutrient deficiencies, often referred to as "hidden hunger," are a critically significant, though often an imperceptible form of malnutrition[1] in various population segments of developing countries such as Pakistan. Zinc, a trace element, is a key component for the effective functioning of nearly 300 metalloenzymes, as well as having roles in metabolism mechanisms of DNA and RNA, immune response mechanisms, signal transduction, cell division, and gene expression.[2,3] Zinc deficiency in pregnant women, if untreated, can have significant negative pregnancy outcomes and linear growth problems for children, such as premature delivery, childhood diarrhea–associated morbidity, acute lower respiratory tract infections, stunting, wasting, and underweight children.[4,5]

Serum zinc concentration studies are the key indicators and mainstay of determination of zinc deficiency levels in Pakistan. Regional and nationwide surveys and biochemical analyses in Pakistan indicate that the subclinical deficiency of zinc among pregnant as well as nonpregnant women and children is widely prevalent, with the most recent National Nutrition Survey of 2011 reporting zinc deficiency in 47.6% of pregnant women, 41.3% nonpregnant women, and 39.2% children under the age of 5 years (Figure 1).[6] Moreover, the survey also indicated that the prevalence of zinc deficiency did not experience a major shift, with 41.9% reported in National Nutrition Survey of 2009 and 41.3% in its updated volume of 2011; however, there was a 2.1% increase in zinc deficiency among children under 5 years of age over the same period.[6]

The findings regarding zinc deficiency in Pakistan have also been substantiated by international research on this public health challenge. Akhtar[4] reported that a few studies conducted on zinc deficiency in Pakistan indicated 54.2% school-going children and 37.1% children of preschool age to be deficient. Moreover, nearly half of children under 5 years of age are stunted, and about 1 in every 3 is underweight in Pakistan.[1] However, currently, the key limitation in determining the precise extent and prevalence of zinc deficiency in Pakistan appears to be the insufficient number of studies being conducted for the evaluation and monitoring of the situation over the past 4 to 6 years. This trend, in turn, is also hampering the mitigation efforts and formulation of effective implementation strategies for the immediate and long-term future scenarios.

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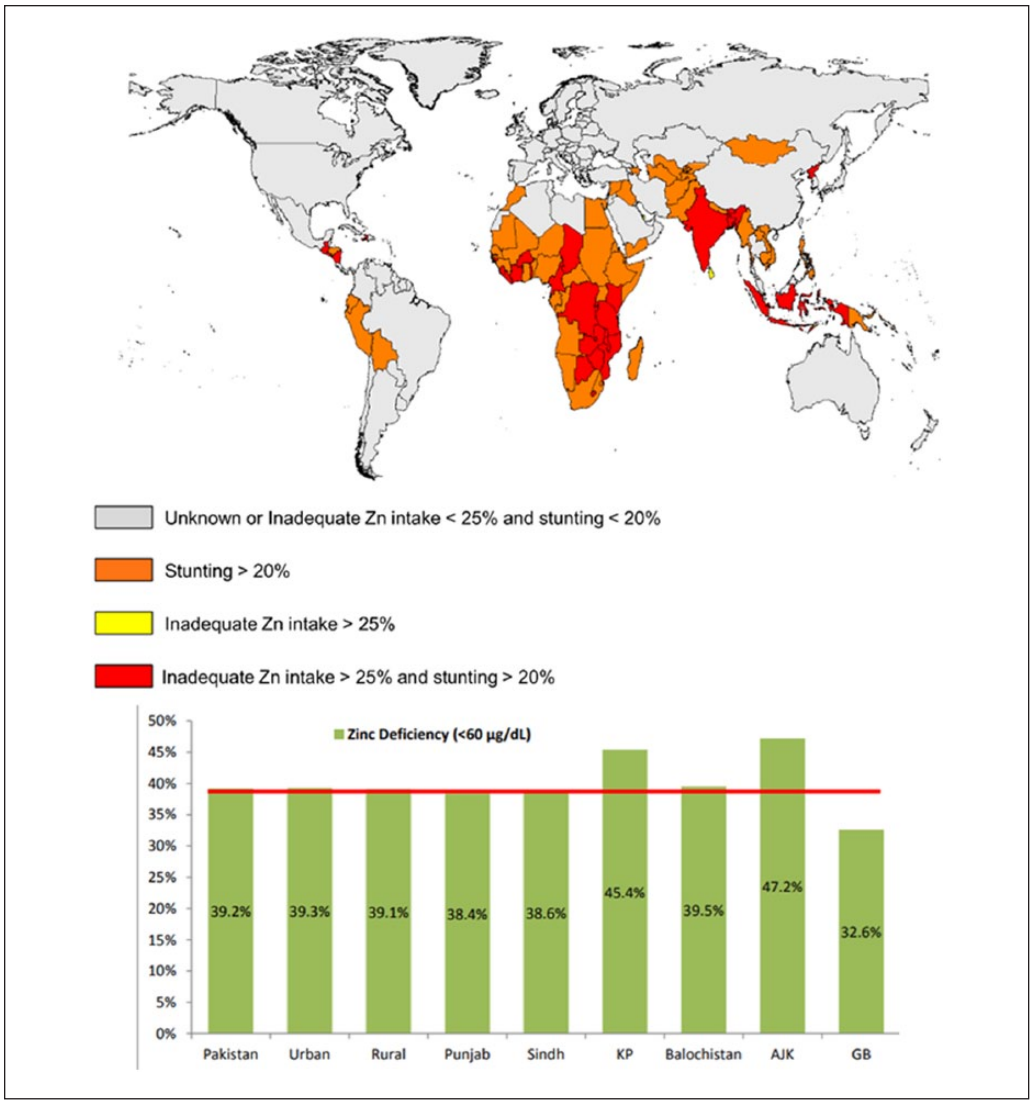

Figure 1. Zinc availability in national food supplies and the prevalence of stunting. The prevalence of zinc deficiency in Pakistani children less than 5 years of age.[1,6]
The red line indicates significant zinc deficiency in almost all provinces of Pakistan. KP stands for Khyber Pukhtunkhwa provinces, AJK stands for Azad Jumma and Kashmir, and GB stands for Gilgit-Baltistan.

It has been widely acknowledged over the decades that micronutrient deficiencies are highly prevalent across Pakistan. But as Wieser et al[1] reported, apart from policies for the eradication of iodine deficiency, the improvement in deficiency levels for other micronutrients has been largely insignificant. Likewise, the guidelines set forth by the Pakistan Standards and Quality Control Act for the mass fortification of essential foodstuff such as wheat flour, edible oil, and ghee, as well as iodized salt, have been, except for iodized salt, mostly unsuccessful.[1] Therefore, effective execution of policies such as complementary feeding, diet diversification, mass fortification, and multiple micronutrient supplementation, aimed at both pregnant and breastfeeding mothers, as well as young school-age children, should be the way forward.

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